

**FORMATION CONSTANTS OF ACTINIDE CARBONATE COMPLEXES
AT ELEVATED TEMPERATURES BY LASER-INDUCED
PHOTOACOUSTIC SPECTROSCOPY**

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Chemical thermodynamic data on the formation of aqueous solution complexes by long-lived radionuclides as a function of temperature are needed for near-field studies of proposed nuclear waste repositories. A number of actinide complexes can be studied using high-sensitivity optical absorption spectroscopy. We are investigating actinide hydrolysis and carbonate complexes in the temperature range 20 to 75°C using photoacoustic spectroscopy. In our apparatus, the light source is a Nd:YAG-pumped dye laser, and the photoacoustic signal generated in the sample solution is detected with a piezoelectric transducer coupled to a thermostatted quartz sample cell. Results and analyses of recent investigations of U(VI)-carbonate and Am(III)-carbonate complexes, in 0.1 M ionic strength media, will be presented. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract number W-7405-Eng-48.